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| 10/526,843 | 03/03/2005 | Chenghui Luo | fraunh01.049 | 9357 |
| <div>7590 Gordon E Nelson Patent Attorney 57 Central Street P O Box 782 Rowley, MA 01969</div> | | | | |
| EXAMINER | | | | |
| GYORFI, THOMAS A | | | | |
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/526,843

Applicant(s)

LUO, CHENGHUI

Examiner

Thomas Gyorfi

Art Unit

2435

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 February 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 22-29 is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/CD/CD)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

1. Claims 1-29 remain for examination. This case has been reopened in view of the decision of the pre-appeal brief review filed 4/28/09.

Claim Rejections - 35 USC § 101

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
3. Claims 1-13 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Regarding claim 1 (and its dependents), the claim(s) are directed to a software object contained in a "memory device". The phrase "memory device" is typically understood to represent either physical computer memory or alternatively, the data structure in which the claim elements are contained. Under the latter interpretation, this is still software *per se* and is still non-statutory. See MPEP 2106.01, *In re Lowry*, 32 F.3d 1579, 1583-84, 32 USPQ2d 1031, 1035 (Fed. Cir. 1994), and *In re Warmerdam*, 33 F.3d 354, 1360-61, 31 USPQ2d 1754, 1759-60. Examiner suggests that this may be remedied simply by using only the term "memory" as supported by the instant specification (page 3, lines 18-25).

Regarding claim 6 (and its dependents), the claim(s) are directed to "an improved class loader that loads a class in a program execution environment in a host computer system". Although the class loader's function is to provide the host computer with programs, this is not strictly speaking the same as reciting that the class loader is itself

being executed by the host computer system; thus these claims are also directed to software per se and are non-statutory for substantially similar reasons.

Claim Rejections - 35 USC § 103

4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.
5. Claims 6-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takeuchi et al. (U.S. Patent 6,820,200) in view of "Java Tip 22: Protect Your Bytecodes from Reverse Engineering/Decompilation" (hereinafter, "Mahmoud").

Regarding claims 6 and 14:

Takeuchi discloses an improved class loader (and method of operating same) comprising: using at least one association between the encrypted forms and information used to resolve the symbolic names defined in the class to resolve symbolic names in the program (col. 8, line 50 – col. 9, line 5); and adding a method to the program which determines whether the program has been modified by the host (col. 8, lines 20-50).

Although Takeuchi discloses one association between the encrypted symbols and the decrypted symbols, there does not appear to be any other association of any kind. However, Mahmoud discloses wherein one may create a different kind of association (between the original symbols and obfuscated symbols: pages 2-4, "Crema to the Rescue") that is also useful for preventing reverse engineering. The claims are thus obvious because all the claimed elements were known in the art, and one of

ordinary skill in the art could have combined them by known methods with no known change in their respective function (i.e., if one were to provide as input to Takeuchi's program certificate authority server the obfuscated program generated by Mahmoud's Crema program, rather than one's original Java program, the claim limitations would be satisfied in full), and the combination would have yielded predictable results to one of ordinary skill in the art. Additionally, one would have been motivated to combine the two references because both are directed to methods to prevent reverse engineering of one's Java code (Mahmoud, bottom of page 3; Takeuchi: col. 1, lines 50-67).

Regarding claim 7:

Takeuchi further discloses wherein the method is encrypted prior to being added to the program and the improved class loader decrypts the method on adding the method to the program (col. 8, lines 20-50).

Regarding claim 8:

Takeuchi further discloses wherein the program includes information from which the method determines whether the program has been modified by the host (any program that does not decrypt properly has obviously been modified: col. 9, lines 45-67; see also col. 11, lines 20-25 and col. 12, lines 35-40).

Regarding claims 9 and 17:

Takeuchi further discloses wherein the program includes a static watermark (col. 11, lines 35-50) and the static watermark is the information from which the method determines whether the program has been modified by the host (col. 12, lines 15-40).

Regarding claim 10:

Takeuchi further discloses wherein the static watermark's value is a digest of the code prior to the addition of the static watermark (col. 11, lines 60-65).

Regarding claims 11 and 19:

Takeuchi further discloses wherein the static watermark is at a location in the program determined by a key and the method has access to the key and uses the key to locate the static watermark (col. 12, lines 15-40).

Regarding claims 12 and 20:

Takeuchi further discloses wherein the improved class loader has access to an encryption key that was used to produce the encrypted forms in the first association (col. 9, lines 45-67); and the improved class loader uses encryption key to produce second association on loading the class (Ibid).

Regarding claims 13 and 21:

Takeuchi further discloses wherein the program includes an encrypted form of the encryption key used to produce the second association (col. 10, line 55 - col. 11, line 15), and the improved class loader obtains the encryption key by using a decryption key to decrypt the encrypted form of the encryption key (Ibid).

Regarding claim 15:

Takeuchi further discloses wherein the added method is encrypted (col. 11, lines 55-60); and the step of adding the method includes the step of decrypting the method (col. 12, lines 15-25).

Regarding claim 16:

Takeuchi further discloses wherein the program includes information which the added method uses to determine whether the program has been modified by the host (the digest: col. 11, lines 60-65 and col. 12, lines 25-40).

Regarding claim 18:

Takeuchi further discloses wherein the static watermark's value is a digest of the code prior to the addition of the static watermark (col. 12, lines 15-40) and wherein the added method reads the static watermark, recomputes the digest, and compares the recomputed digest with the watermark's value (Ibid, particularly lines 25-40).

Allowable Subject Matter

6. Claims 1-5 and 22-29 are allowable over the prior art of record.
7. The following is a statement of reasons for the indication of allowable subject matter: Independent claims 1 and 22 are more specific regarding the nature of the first and second associations, providing wherein the first association maps from obfuscated symbols to encrypted symbols, and wherein the second association maps from encrypted symbols to normal (non-obfuscated) symbols. This structure is different from the associations in the prior art of record as discussed in the rejections of independent claims 6 & 14 *supra*, and the prior art does not suggest making the associations in this same, exact manner. Dependent claims 2-5 and 23-29 are allowable by virtue of their dependence on claims 1 and 22, respectively.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure, all to Takeuchi et al:

- U.S. Patent 6,647,495
- European Patent 0875814 A2
- European Patent 0875815 A2

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thomas Gyorfi whose telephone number is (571)272-3849. The examiner can normally be reached on 8:30am - 5:00pm Monday - Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kim Vu can be reached on (571) 272-3859. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

TAG
7/2/09
/Kimyen Vu/
Supervisory Patent Examiner, Art Unit 2435